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TECHNICAL REPORT R-92-1



US Army Corps
of Engineers

A SUMMARY OF SPENDING PROFILES FOR RECREATION VISITORS TO CORPS OF ENGINEERS PROJECTS

by

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Preface

The work reported herein was conducted as part of the Natural Resources Research Program (NRRP). The NRRP is sponsored by the Headquarters, U.S. Army Corps of Engineers (HQUSACE), and is assigned to the U.S. Army Engineer Waterways Experiment Station (WES) under the purview of the Environmental Laboratory (EL). Funding was provided under the Department of the Army Appropriation 96X3121, General Investigation. The NRRP is managed under the Environmental Resources Research and Assistance Programs (ERRAP), Mr. J. L. Decell, Manager. Dr. A. J. Anderson was the Assistant Manager, ERRAP, for the NRRP. Technical Monitors during this study were Mr. Robert Daniel and Ms. Judy Rice.

This report was prepared by Dr. Dennis B. Propst and Dr. Daniel J. Stynes, Department of Park and Recreation Resources, Michigan State University, and Mr. R. Scott Jackson of EL. The study was supervised by Mr. H. Roger Hamilton, Chief, Resource Analysis Group. General supervision was provided by Dr. Conrad J. Kirby, Chief, Environmental Resources Division, EL, and Dr. John Harrison, Director, EL. Technical Reviewers were Ms. Tere DeMoss and Ms. Kathleen Perales. In addition, Ms. Tere DeMoss provided significant technical support in the preparation of the report.

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1 Introduction

The purpose of this report is to present spending profiles for visitors to Corps of Engineers (CE) projects. The results of this work will be used as part of the process of assessing the economic impact of recreation opportunities at Corps projects. Visitor spending at 12 CE projects across the United States was estimated for both trip and durable goods expenses. In addition, total trip spending for CE projects nationwide was estimated at \$6.2 billion and total durable goods spending attributable to CE projects was estimated at \$15 billion. Further, a system for estimating economic impacts for any project is proposed based upon a set of spending profiles for 12 recreation market segments. Spending may be estimated in 33 trip spending categories and 4 major categories of durable goods. These visitor spending profiles are in the correct form to be margined and bridged to specific economic sectors. This will allow indirect, induced, and total economic effects of recreation spending to be estimated through the use of economic input-output models.

2 General Survey Procedure

A total of 3,185 onsite personal interviews were conducted during the summers of 1989 and 1990 at 12 CE projects. Visitors were surveyed at J. Percy Priest, McNary/Ice Harbor, Mendocino, Oahe, Raystown, and Shelbyville Lakes in 1989 and at Cumberland, Dworshak, Lanier, Milford, Ouachita, and Willamette Lakes in 1990 (Figure 1). These sites were selected to represent a diversity of CE projects in terms of regions, amount and type of use, amount of recreation development at the lake, and surrounding populations. A profile of users, trip characteristics, and durable goods spending was gathered in on-site interviews. Trip spending was measured with a mailback survey returned at the end of the trip. Using two follow-up reminders achieved an overall response rate for the

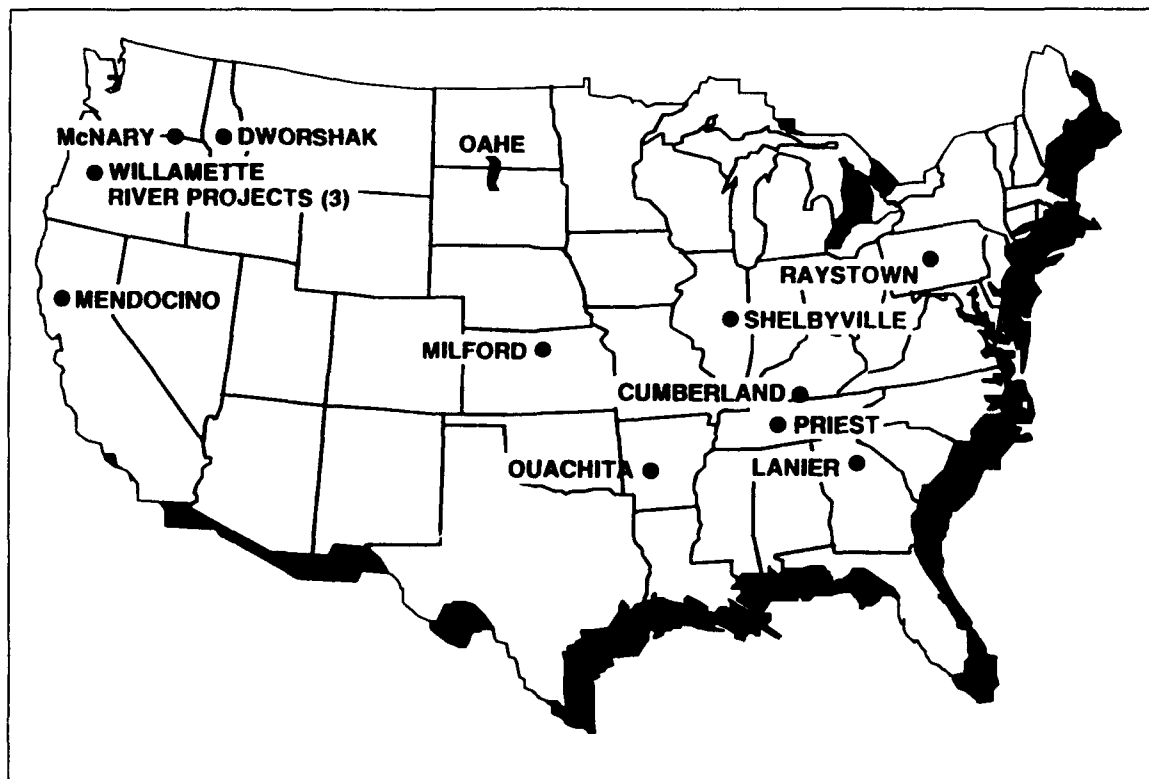


Figure 1. Location of CE study projects, 1989-1990

mailback survey of 70 percent, yielding 2,190 trip spending surveys for analysis.

The study was designed to achieve sufficient sample sizes within designated subgroups or market segments to estimate spending at the subgroup level. Segments were defined based upon place of residence (within or outside 30 miles¹ of lake), day users versus overnight visitors, and whether the party was or was not boating. Overnight visitors were divided into those staying in campgrounds versus parties staying in other accommodations. These segments are designed to explain differences in overall durable and trip spending patterns. In addition, the segments improved the ability to estimate spending within specific categories such as lodging, restaurant, groceries, and boating-related expenses. By forming segments that are more homogeneous in their spending patterns, smaller sample sizes can be used to achieve a given level of accuracy. These sampling efficiencies were adopted because of the wide variation in spending and the costs of gathering expenditure data. Figure 2 presents the percentage distribution of user segments included in the sample.

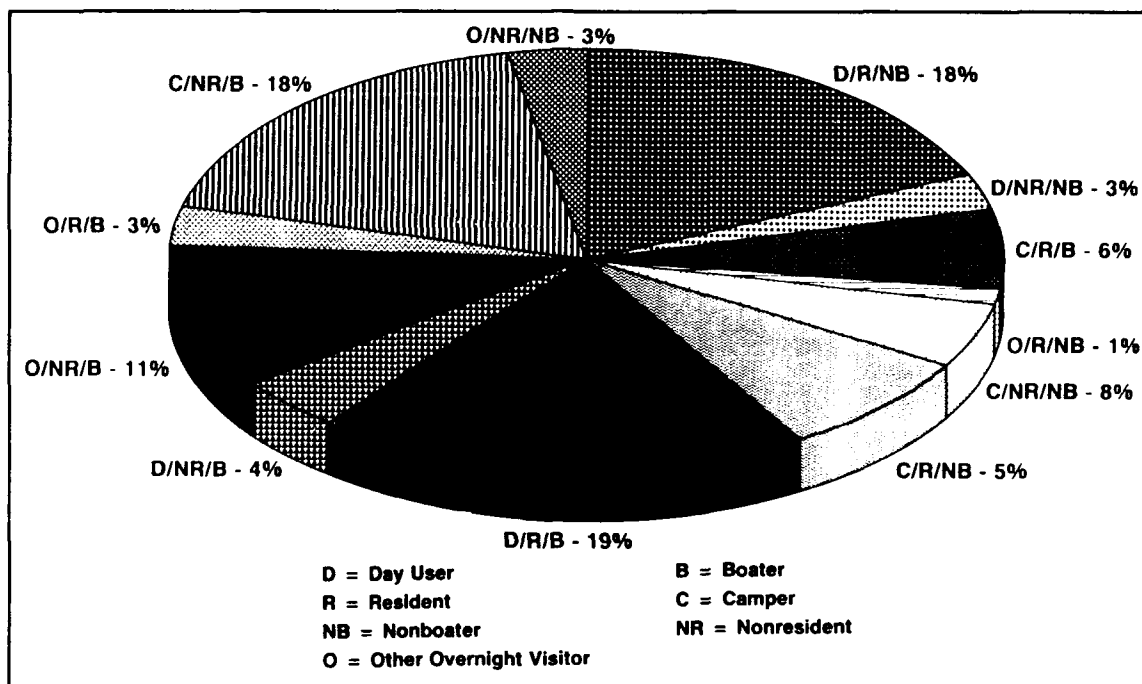


Figure 2. Distribution of 12 visitor segments for all 12 lakes

Sampling procedures were designed to obtain adequate samples of visitors within the principal segments rather than to obtain a representative sample of visitors to each lake. The results for each lake must therefore be weighted based upon the proportion each segment constitutes of total

¹ To convert miles to kilometres, multiply by 1.609347.

use. As some of these proportions cannot be estimated under the existing visitation reporting system, we are only able to adjust the sample for disproportionate sampling of day users versus campers. Even here, visitors staying overnight, but not in campgrounds at the projects, are counted as day users in Corps use estimates. As improved estimates of the proportions of visitors within each segment become available, the estimates can be adjusted and improved by weighting spending profiles for individual segments by each segment's proportion of total visits to a project.

3 Trip Spending

Trip spending was measured and reported on a per party per trip basis. Across the 12 lakes sampled, the average party spent \$76 per trip. Food accounted for 27 percent of this total, boating-related expenses 24 percent, and auto expenses 20 percent. Miscellaneous items, including gifts and souvenirs, accounted for 14 percent.

Trip spending varies considerably by user segment. Figure 3 presents the distribution of trip spending by day users, campers, and other overnight visitors. Day users, who account for 94 percent of visitors to the 12 study lakes, spend an average of \$63 per trip, while camping parties average \$270 in spending per trip. Camper spending is divided into the following proportions: 32 percent to food and beverages, 22 percent to auto expenses, and 13 percent each to lodging and boating-related expenses. Overnight visitors who are not camping average \$471 in trip spending per party with almost a third of this allocated to lodging, 27 percent to food, 14 percent to boating-related items, and 12 percent to auto expenses. Trip spending for the most common visitor segments are:

Resident day users who boat	\$75
Resident day users not boating	\$42
Nonresident campers who boat	\$338
Nonresident campers not boating	\$300
Nonresident overnight not boating	\$362
Nonresident overnight who boat	\$537

Figure 4 presents average trip spending for all visitors surveyed at each lake. Across the 12 study lakes, trip spending varied from \$43 at Shelbyville to \$135 at Milford. These differences are partially explained by the proportion of different user segments attracted to each lake. Spending by day users varied from \$43 per trip at McNary to \$104 at Lanier. Camper spending varied from \$184 at McNary and Shelbyville to \$482 at Willamette Lakes. Overnight visitors at Lake Cumberland not staying in campgrounds averaged \$702 per party in trip spending, double that of most of the other lakes. The high level of spending for this group at Lake Cumberland is largely due to the popularity of houseboat rentals at the lake. Sampling errors (95-percent confidence interval) for total trip spending is 8 percent with major categories of spending estimated within ± 16 percent.

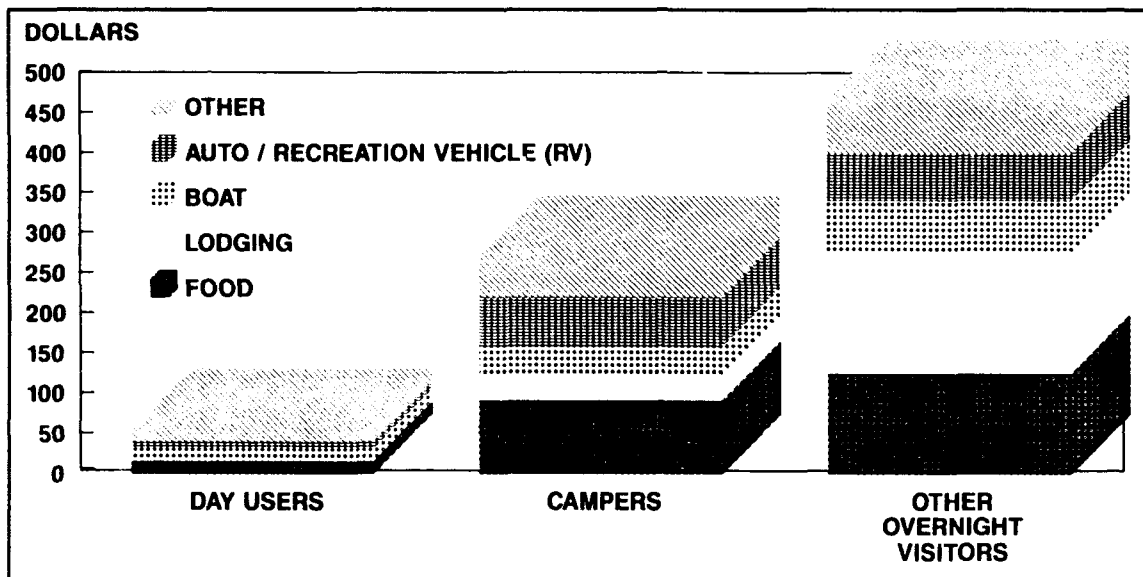


Figure 3. Average trip spending (per party per trip) by item for day users, campers, and other overnight visitors

Trip spending may be estimated for individual segments or lakes by multiplying spending profiles by estimates of use (Figure 5). At this time, we can only obtain estimates of total use broken down by day users and campers. Using these data, total trip spending at each of the 12 study lakes is estimated, and results are extended to a national estimate of spending at CE projects. For example, visitors to Lanier in 1989 spent \$223 million, with 84 percent of this taking place in the local area. At the 12 study lakes a total of \$738 million was spent on trips in 1989. The average total spending across the 12 study lakes was \$62 million in 1989 with an average of 77 percent of trip spending taking place in the local area. For the purpose of assessing economic impacts, it becomes essential to assign spending to a geographic location in order to properly allocate economic impacts to a specific region.

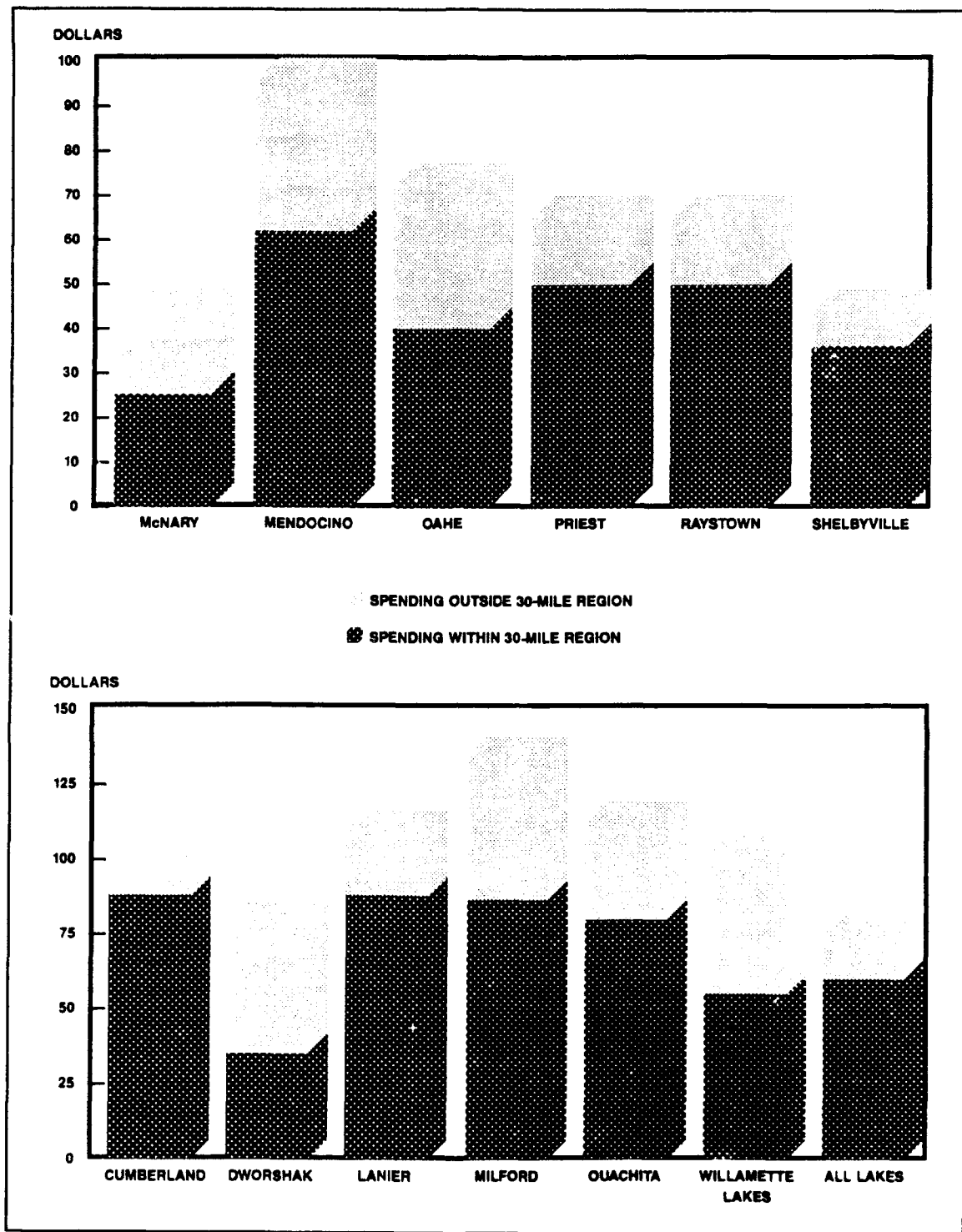


Figure 4. Average local and nonlocal trip spending per party per trip by lake

4 Durable Goods Spending

Visitors to the 12 lakes spend a total of \$2.7 billion annually on durable goods used on trips to the lake. This is equivalent to \$394 per trip, counting only durable items purchased within the past year. Seventy percent of the sample brought at least one durable item with them on the trip for use at the lake. Visitors with durable items included virtually all campers, 94 percent of boaters, and 68 percent of day users. Durable spending varies considerably across different user segments. Day users average an equivalent of \$208 per trip, while campers average \$2,070 per trip. Camping vehicles constitute 30 percent of all durable spending, boats, trailers, and motors 68 percent. Overall spending on boating and camping equipment constitutes 98 percent of all durable spending. Twenty-nine percent of all spending on durable goods occurred in the local region.

Unlike trip spending, which can be directly related to the trip to the lake, durable goods may be used over several years at many different sites. All of the cost of durables brought to a CE lake cannot be attributed to the presence of the lake. For economic impact analysis, the question is whether the item would have been bought if the opportunity to use it at the CE site did not exist. As this hypothetical question is difficult to answer in a survey like this one, we estimated shares of durable spending that might be attributed to the CE project by measuring the percentage of use of each item at the study lake versus all other sites in the past year. This percentage varied considerably by lake, as it depends on the type of equipment, percentage of local versus nonlocal users, and the number of substitute opportunities in the area. From the six 1990 study lakes, the average share of durables attributed to the CE based on the proportion of use is 52 percent. Shares were lowest for campers (41 percent) and highest for day users (67 percent), reflecting a greater tendency to use large camping equipment at many sites as compared with boating equipment. The "share" of the purchase of a large camping vehicle will also be lowered if uses of camping vehicles other than for visits to camping areas is taken into account.

Total durable spending averages were adjusted downward to reflect the proportion of times each item was used at one of the study lakes versus elsewhere. The durable spending share averages were: \$215 average

trip for campers, and \$411 per trip for other overnight visitors. When the durable spending shares are applied to visitation at all study lakes, annual durable spending is estimated at \$1.6 billion. Figure 5 presents estimated 1989 durable good spending shares for each lake. In addition, trip spending is presented in Figure 5 to illustrate differences between local and non-local trip and durable spending patterns. Total trip and durable spending ranged from a high of \$386 million durable and \$223 trip spending at Lake Lanier to a low of \$4 million durable and \$13 million trip spending at Lake Dworshak.

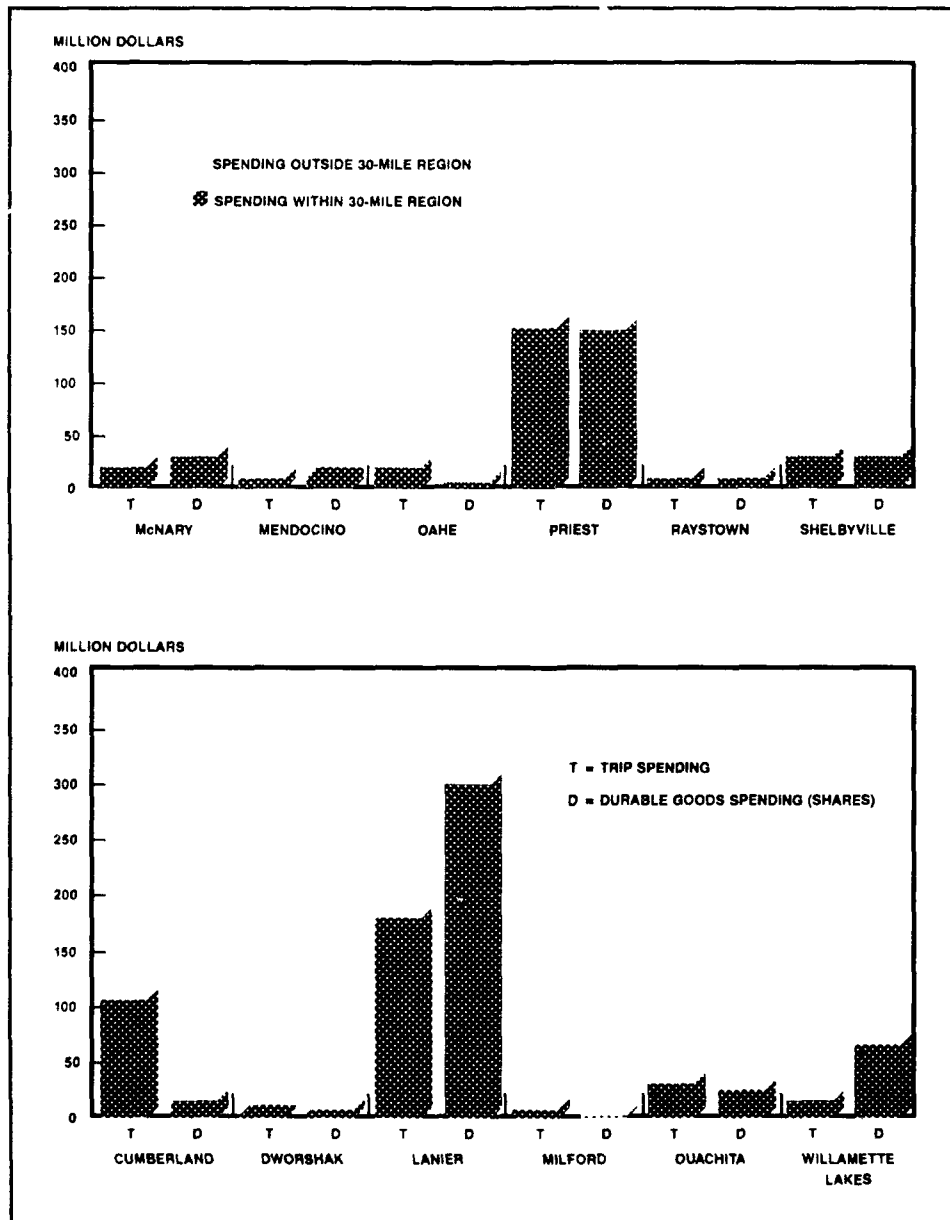


Figure 5. Total trip (T) and durable goods (D) spending locally and nonlocally by lake

5 National CE Recreation Spending Estimates

As both trip and durable spending estimates are reported on a per party per trip basis, annual estimates of total spending associated with trips to CE sites may be obtained by multiplying our estimates by the number of party visits to a site. Regional or national estimates may be obtained by multiplying the spending profiles by regional or national use estimates. The 12 lakes sampled generate a combined total of \$738 million in trip spending and \$2.7 billion in durable goods purchases by visitors in 1989. The CE "share" of durable purchases, based upon use of equipment, is about \$1.6 billion. These estimates may also be disaggregated to particular segments or economic sectors.

Applying the results to generate totals for the study lakes themselves, some other CE project, or regional or national totals rests on the assumption that our sampled lakes and the sample at these lakes provide representative spending profiles. There is clearly wide variation across CE projects in visitor spending. No single "profile" can adequately represent all of this variation. Variations in spending at CE lakes depends on (a) the amount of total use, (b) the proportion of use by different segments, and (c) the nature of the local economy. The system proposed here relies on CE visitation estimates to explain differences due to total use or types of use. The 12 user segments capture variations in spending across the Corps' primary recreational user groups. Variation in the local economy may also influence the geographic distribution of visitor spending. Projects located in heavily populated areas or areas with extensive commercial development clearly generate more local spending per visitor than projects located in remote areas. Twelve lakes is not an adequate sample to identify this relationship very precisely. In applying the results to non-surveyed lakes, one could, however, choose the spending profile for one of the 12 lakes that most closely resembles the new situation. In some cases, this is likely preferred to using "average" spending estimates.

By applying the average spending estimates from the 12 study lakes to national CE visitation estimates, total trip spending for all CE projects nationwide in 1989 was estimated to be \$6.16 billion. Durable purchases within the past year for all CE projects were almost \$30 billion, of which

\$15 billion may be attributed to the CE. Figure 6 presents total estimated 1989 trip and durable spending (shares) estimates for all CE Divisions. The CE clearly makes a substantial contribution particularly to purchases of boats, trailers, and motors. However, with the possible exception of projects located near urban areas, durable purchases will have smaller impacts on a given local economy. This is because durables are less likely to be purchased in the local area, and even for large durables that are purchased locally, only the retail margins will contribute to the local economy. Most of the durable spending will flow out of the local area to places where the recreational vehicles and boats are manufactured.

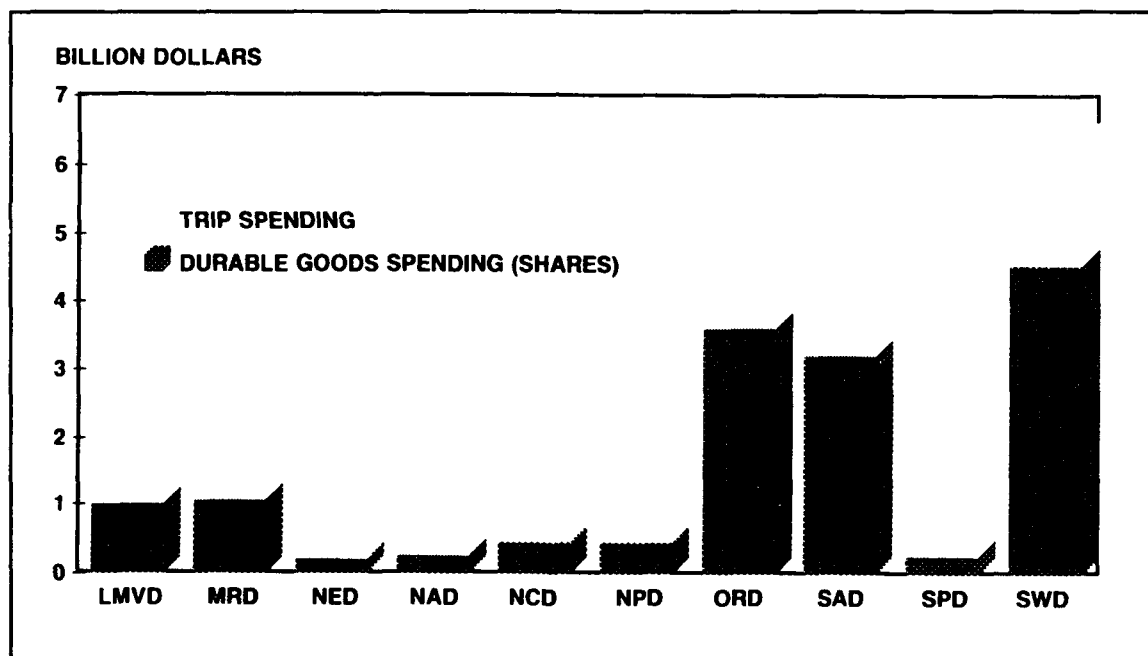


Figure 6. Total trip and durable goods spending by CE Division, 1989-1990

6 Applying Spending Profiles To Nonsurveyed Projects

Visitor spending surveys presented in this report measured visitor spending on a per party trip or party visit basis. The Corps does not report visitation in terms of party visits. Therefore, applying the results of the spending survey to CE projects requires that spending profiles be converted to a unit of visitation reported by the Corps.

Table 1 presents total trip and durable good spending for all campers, day users, and other overnight visitors included in the 12-project survey on a per visit basis. A visit is defined as the entry of one person onto a project to engage in one or more recreation activities. Spending on a per visit basis was computed by dividing spending rates presented in Figure 3 by the average party size of surveyed parties. Durable good spending is reported based on the "share" of total durable good spending reported by the respondent that was allocated to the surveyed project.

Table 1
Visitor Spending on a per Visit Basis

Visitor	Trip Spending			Durable Spending ¹		
	Mean ² , \$	n	Percent Local ³	Mean ² , \$	n	Percent Local ³
Day users	21.50	926	80	47.44	1,412	45
Campers	82.57	870	62	259.63	1,185	20
Other overnight visitors	143.16	385	77	124.92	552	15

¹ Durable spending reported on "share" proportions.

² Mean spending is reported on a person visit basis.

³ Local expenditures are made within 30 miles of the project.

These visitor spending profiles can be used by CE planners and managers to develop general estimates of visitor spending. The spending rates presented in Table 1 must be multiplied by the reported number of project visits for campers and day users to estimate total spending. When local spending data are available, these "national averages" may be adjusted to better represent local conditions. A more detailed discussion of the development and analysis of spending profiles for each lake in the study is contained in Propst et al., in preparation.¹

Spending rates for "other overnight visitors" (i.e., visitors who use motels, cabins, and other types of commercial accommodations during their visit to the project) are presented separately because they spend at much higher rates than campers and day users. Estimating total spending at a CE project for this type of visitor is difficult because "other overnight visitors" are not reported as a separate user group in current CE visitation reporting procedures. However, counts provided by motel and resort operators located on or adjacent to the project can be used to provide a rough estimate of the number of visits by this user group.

All of the assumptions and limitations previously discussed when producing national estimates of visitor spending based on survey results pertain when applying the visitor spending profiles presented in Table 1 to nonsurveyed projects.

¹ Dennis B. Propst, Daniel J. Stynes, Ju Hee Lee, and R. Scott Jackson. Development of spending profiles for recreation visitors to Corps of Engineers projects (in preparation). Vicksburg, MS: U. S. Army Engineer Waterways Experiment Station

7 Economic Impact Estimates

A good estimate of visitor spending is one of the basic ingredients in an economic impact assessment. To fully account for the effects of visitor spending on a local area, the dollars spent by visitors must be traced through the local economy. A good way to capture these flows is through the use of an input-output model. Spending estimates reported herein are designed to be suitable for use with IMPLAN, an input-output model developed and maintained by the U.S. Department of Agriculture Forest Service. By using the spending estimates with an input-output model, indirect and induced effects of visitor spending may be estimated and flows of economic activity may be traced to particular economic sectors. Further, contributions to local income and employment may be estimated. A simpler, but less accurate and less detailed, approach is to use local economic multipliers.

It is important to recognize the distinction between local economic impact and total spending associated with a CE project. In a local economic impact study, a local region must be defined. Our system suggests that the region be defined as all counties within 30 miles of the project, as we have estimated spending within and outside of a 30-mile boundary. One must then distinguish between visitors from within this region and visitors from outside the region. This is done via the twelve user segments, six are local users and six are from outside the 30-mile radius. In estimating spending by nonlocals in the local area, one would use only the six nonlocal segments and include only their spending within 30 miles of the site. This will require that the CE be able to estimate the percentage of users from outside the local area, or more specifically the percentage of visitors from the six nonlocal segments. To fully take advantage of the system, percentages of visitors from each of the six nonlocal segments are needed. If unavailable, percentages of day users and campers from outside the local region would suffice. The percentage for campers could be obtained from analysis of campground registration forms. Nonlocal shares for day users would require some other approach, be it visitation surveys, license

plate counts at day use areas, use of a local trip generation model, or manager judgment.

The percentages of local versus nonlocal users varies considerably across projects, as illustrated by the 12 sampled lakes. While samples may not be representative of the nonlocal shares, the percentages of local residents in the samples was observed to vary from 22 percent at Cumberland to 87 percent at Priest. The percentage of spending that occurs locally also varies considerably by lake and user segment. Local residents obviously incur virtually all of their trip expenses in the local area. For nonresidents, the percentage of trip spending within the region varies between 50 and 90 percent. Some categories of expenses are more likely to be made locally than others. Durable goods, in particular, are more likely to be purchased near the visitor's home, with the possible exception of boats that may be purchased near the lake. Thus, most purchases of durables by nonlocal residents are made outside the local area. Trip spending is most appropriate for examining the local economic impacts of a particular CE project, while durable expenses are best used to illustrate broader regional and national impacts. Trip spending accrues largely to a small number of local service sectors of the economy, while the economic impacts of durable goods purchases are principally on particular manufacturing sectors usually located a great distance from the CE project where the durable item was used.

8 Conclusions

Visitor spending profiles in this report are an important tool in the process of assessing the economic impact of CE recreation programs. The spending profiles presented identify differences in spending patterns between user groups (campers, day users, and other overnight visitors) visiting CE Lakes. Accounting for these differences, when coupled with estimated visitation for each user group, improves the ability to predict how visitor spending will change as a result of management actions. Additional improvements in estimating visitor spending can be achieved by incorporating the results of future visitor spending surveys into existing spending profiles.

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